

## CLAIMS

1. A process for manufacturing a sheath for a high-temperature multifilament superconducting cable, characterized in that said sheath is obtained by coextrusion of a cylindrical billet (50) formed from at least two concentric cylinders (52, 54, 56), said billet (50) being produced by forming, inside a container, by cold isostatic pressing, at least two tubes made of powder consisting of the desired materials respectively, and then subjecting these tubes to a sintering operation.
- 10 2. A sheath for a high-temperature multifilament superconducting cable, characterized in that it consists of a tube (10, 30) whose wall comprises, these being diffusion-bonded together:
  - an inner layer of pure silver; and
  - at least one second layer of silver-based alloy.
- 15 3. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from at least two layers, these being diffusion-bonded together, i.e.:
  - an inner layer (12) of pure silver; and
  - an outer layer (14) of a silver alloy of high electrical resistance.
- 20 4. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from three layers, these being diffusion-bonded together, i.e.:
  - an inner layer (16) of pure silver;
  - an intermediate layer (18) of a silver alloy of high mechanical strength; and
  - an outer layer (20) of pure silver.
- 25 5. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from three layers, these being diffusion-bonded together, i.e.
  - an inner layer (16) of pure silver;

- an intermediate layer (18) of a silver alloy of high mechanical strength and high electrical resistance; and
  - an outer layer (20) of pure silver.
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  - an inner layer (16) of pure silver;
  - an intermediate layer (18) of a silver alloy of high mechanical strength; and
  - an outer layer (20) of silver of high electrical resistance.
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  - an inner layer (22) of pure silver;
  - a first intermediate layer (24) of a silver alloy of high mechanical strength;
  - a second intermediate layer (26) of a silver alloy of high electrical resistance; and
  - an outer layer (28) of pure silver.
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  - an inner layer (22) of pure silver;
  - a first intermediate layer (24) of a silver alloy of high electrical resistance;
  - a second intermediate layer (26) of a silver alloy of high mechanical strength; and
  - an outer layer (28) of pure silver.
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9. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from two layers, these being diffusion-bonded together, i.e.:

- an inner layer (32) of pure silver; and
- an outer layer (34) of a silver alloy of high mechanical strength.

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10. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from two layers, these being diffusion-bonded together, i.e.:

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- an inner layer (32) of pure silver; and
- an outer layer (34) of a silver alloy of high mechanical strength and high electrical resistance.

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11. The sheath for a multifilament superconducting cable as claimed in claim 2, characterized in that the wall of the tube is formed from three layers, these being diffusion-bonded together, i.e.:

- an inner layer (36) of pure silver;
- an intermediate layer (38) of a silver alloy of high electrical resistance; and

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- an outer layer (40) of a silver alloy of high mechanical strength.